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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086,861	03/04/2002	Minoru Kawano	027260-517	4298

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EXAMINER

KNAUSS, SCOTT A

ART UNIT

PAPER NUMBER

2874

DATE MAILED: 05/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/086,861	KAWANO ET AL.	
	Examiner	Art Unit	
	Scott A Knauss	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8,9,13-17,20 and 21 is/are rejected.
- 7) ☒ Claim(s) 7,10-12,18,19,22 and 23 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The references cited in the information disclosure statement have been considered.

Drawings

2. The drawings are objected to because of the following informalities. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The specification refers to number #12a in figures 1-4, however no such number exists in said figures.

In figure 15, part #12b is described as #12a in the specification. The examiner recommends that the applicant check to make sure all part numbers in the specification correctly correspond to the part numbers in the figures.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over DE 3617799 (Schmid).

Regarding claim 1 Schmid discloses an optical module in fig. 3, comprising:

An optical element #5

A supporting element #2 supporting the optical element

A first optical fiber #6 having a first end coupled to the optical element and a second end placed near to the supporting element

A second optical fiber spliced #8 to the first optical fiber.

Schmid does not, however, disclose the use of a fusion splice

Nevertheless, fusion splicing is well known in the art to connect two optical fibers together, and it would have been obvious to one of ordinary skill in the art to use known splicing methods to splice the two fibers of Schmid.

Regarding claim 2, the spliced portion #8 is supported by the supporting element

6. Claims 3,4,20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmid in view of US 2002/0003926 (Enomoto et al)

Regarding claim 3 Schmid discloses a module comprising:

An optical element #5

A supporting element #2 supporting the optical element

A first optical fiber #6 having a first end coupled to the optical element and a second end placed near to the supporting element

A second optical fiber spliced #8 (connected) to the first optical fiber.

Schmid discloses the use of a coating material #14 as a mode stripper, which is supported by the supporting element and covers the spliced portion between the two fibers (see end of translation)

Schmid does not, however, disclose the use of a "resin element" as the coating material.

Nevertheless, it is well known in the art to surround fibers with resin material in order to strip unwanted modes. Enomoto, in particular, discloses in fig. 1B and [0005] that it is known in the art that when the peripheral surface of a multimode optical fiber is surrounding by a resin, the cladding modes disappear.

Therefore it would have been obvious to one of ordinary skill in the art to use a resin cladding mode stripper as taught by Enomoto as the cladding mode stripper used by Schmid in order to remove unwanted modes. Such a resin would further be advantageous to cover and reinforce the splice of Schmid, and to fix the optical fibers to a supporting element.

Regarding claim 4 Schmid does not disclose the use of a fusion splice. Nevertheless, fusion splicing is well known in the art to connect two optical fibers together, and it would have been obvious to one of ordinary skill in the art to use known splicing methods to splice the two fibers of Schmid.

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Regarding claim 20, Schmid discloses a method of manufacturing an optical module comprising:

Supporting a first optical fiber #6 on a supporting element #2 while optically coupling an optical element #5 supported on the supporting element to the first optical fiber

Splicing the first optical fiber to a second optical fiber #7 longer than the first fiber to each other.

Schmid does not, however, disclose the use of a fusion splice. Nevertheless, fusion splicing is well known in the art to connect two optical fibers together, and it would have been obvious to one of ordinary skill in the art to use known splicing methods to splice the two fibers of Schmid.

Schmid discloses the use of a coating material #14 as a mode stripper, which is supported by the supporting element and covers the spliced portion between the two fibers (see end of translation)

Schmid does not, however, disclose the use of a "resin element" as the coating material.

Nevertheless, it is well known in the art to surround fibers with resin material in order to strip unwanted modes. Enomoto, in particular, discloses in fig. 1B and [0005] that it is known in the art that when the peripheral surface of a multimode optical fiber is surrounded by a resin, the cladding modes disappear.

Therefore it would have been obvious to one of ordinary skill in the art to use a resin cladding mode stripper as taught by Enomoto as the cladding mode stripper used

by Schmid in order to remove unwanted modes. Such a resin would further be advantageous to cover and reinforce the splice of Schmid, and to fix the optical fibers to a supporting element.

Schmid, as modified, further does not disclose a sleeve into which the fusion spliced portion is inserted, and packing the resin into the sleeve.

Nevertheless, it is well known in the art to pack resin into a sleeve in order to reinforce a fiber splice within the sleeve. Such a sleeve provides extra protection and reinforcement for the splice.

Therefore it would have been obvious to one of ordinary skill in the art to further modify the optical module of Schmid by packing resin into a sleeve for the purpose of providing reinforcement and protection for the spliced fibers disclosed by Schmid.

Regarding claim 21, it is further known in the art to first pack resin in liquid form within a sleeve surrounding spliced fibers, and then to cause the resin within the sleeve to set (harden) for the purpose of supporting the splice within the sleeve.

Therefore it would have further been obvious to one of ordinary skill in the art to pack liquid resin into a sleeve surrounding a spliced fiber connection, and then to harden the resin to support the splice within the sleeve.

7. Claims 3,5,6,8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,680,493 (Naitoh).

Regarding claim 3 Naitoh discloses a module in figures 4 and 6 comprising:

An optical element (#25,#21,#22)

A supporting element #26 supporting the optical element

A first optical fiber #23A having a first end coupled to the optical element and a second end placed near to the supporting element

A second optical fiber #23 connected to the first optical fiber

Naitoh also discloses that the first optical fiber is connected with the second optical fiber by a ultraviolet ray setting resin (col. 1, lines 45-50), and the resin also being supported by the supporting element (see figs. 4 and 6). Naitoh does not, however, explicitly state whether a connected portion between the first and second fiber is covered by the resin.

Nevertheless, in order to securely connect the two fibers, it would be advantageous to place resin around the areas to be directly connected to each other in order to provide a strong, secure connection with high optical coupling, thus covering the connection with resin.

Therefore it would have been obvious to one of ordinary skill in the art to cover to connected portion between the two fibers with resin in order to align the two fibers with each other and to secure and strengthen the connection of the two fibers.

Regarding claim 5, Naitoh discloses a ferrule #24, which can be considered a sleeve, covering the resin

Regarding claim 6, the ferrule inherently has a through hole for the fibers to pass through

Regarding claim 8, the ferrule is transparent, through which ultraviolet rays are transmitted to harden the resin and thus unify the fibers.

Regarding claim 9, Naitoh discloses that the ferrule is made of quartz (col. 2, line 22), but fails to disclose a glass ferrule.

Nevertheless, glass ferrules are well known in the art, and it would have been an obvious design choice to one of ordinary skill in the art to substitute equivalent transparent ferrules into the module of Naitoh, since there is no stated criticality in the disclosure for a glass ferrule.

8. Claims 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naitoh in view of US 5,018,821 (Kurata).

Regarding claim 13, Naitoh, as modified above, discloses an optical module with all the limitations of claims 3 and 5, and discloses a fixing member (adhesion or soldering) which holds sleeve #24 on base #26 (see col. 3, lines 28-30 but does not disclose the use of a holding element fitted to a sleeve).

Kurata, on the other hand, discloses a similar method of connecting optical fibers in fig. 3, in which optical matching material is used to connect two fibers #11 and #15.

Kurata further discloses the use of a holding element #10 fitted to a sleeve body #13 for the purpose of effecting a connection between two fibers by the insertion of an optically matching material. Such a configuration is advantageous because it provides an easier method of inserting a matching material to connect two fibers. Although Kurata does not disclose the use of resin as a matching material, it is well known to use any type of resin for such a purpose, as taught, for example, by Naitoh (see abstract), and thus would have been obvious to one of ordinary skill in the art to substitute known

matching materials into the configuration of Kurata to effect a connection between two fibers.

Therefore it would have been obvious to one of ordinary skill in the art to substitute the optical connector ferrule of Kurata for the ferrule for the ferrule of Naitoh in order to facilitate a connection between two fibers using an optical matching material such as resin. Naitoh, as further modified by Kurata, would then have a holding element fitted to a sleeve, the sleeve being fixed to the base #26 of Naitoh

Regarding claim 14, Kurata discloses that a first fiber #11 is held by an adhesive #12a which may be a thermosetting epoxy adhesive (see col. 4, lines 67-68), which can be considered to be a resin.

Regarding claim 15, Kurata discloses the use of a glass holding element #10 (col. 5, lines 21-22), but does not specify the use of a glass sleeve #13. Nevertheless, glass ferrules are well known in the art, and it would have been obvious to one of ordinary skill in the art to substitute known ferrules for the ferrule #13, in particular glass ferrules, in order to provide a hard ferrule to protect the fiber connection, thus providing a holding element and sleeve of the same substance.

Kurata discloses the use of a thermosetting resin #12b in a fitting space between the sleeve and the holding element, but does not specify a UV hardening resin. Nevertheless, it would have been obvious to one of ordinary skill in the art to substitute known resins for the resin #12b, in particular UV resins, in order to bond the holding element and sleeve together quickly and easily.

Regarding claim 16, Kurata discloses in fig. 3 the use of a slit (groove) #10a into which an optically matching material, in this case as modified above, resin would be packed into groove #12a

Regarding claim 17, Kurata discloses the holding element and first optical fiber being covered with resin, which would then be supported on the supporting element of Naitoh.

Allowable Subject Matter

9. Claims 7 and 10-12,18,19,22 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 7, there is no teaching or suggestion to place a through hole almost on the center of the sleeve of Naitoh.

Regarding claims 10-12, the prior art fails to teach or suggest modifying the module of Naitoh by attaching a resilient (i.e. flexible) hood to the module which covers the sleeve, and then having the second optical fiber protrude from the hood.

Regarding claims 18 and 19, the prior art fails to teach or suggest modifying the module of Naitoh to have a package to seal the optical element, wherein the package has a protrusive portion on the *outside* of the package which holds the *first* fiber (i.e. the fiber closest to the optical element).

Regarding claims 22 and 23, the prior art fails to teach or suggest further modifying the optical module of Schmid by first inserting the first optical fiber into a holding element, packing resin into the holding element, placing the holding element on

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a fixing member, and then fitting the holding element to the sleeve to insert the fusion spliced portion into the sleeve.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

GB 2,148,537 (Ralph) discloses a method of reinforcing a splice in a tube using resin.

JP 63-307409 (Morimoto et al) discloses another method of forming a connection using matching material in a holding element fitted to a sleeve.

US 5,121,451 (Grard et al) discloses two fibers spliced and supported on a common element and coupled to an optical element.

US 6,280,102 (Go) and 6,004,046 (Sawada) disclose known packages for optical modules.

GB 2,166,975 (Byron) and US 6,278,816 (Keur et al) each disclose the use of resin to surround optical fibers and strip modes.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott A Knauss whose telephone number is (703) 305-5043. The examiner can normally be reached on 9-6 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (703) 308 - 4819. The fax phone numbers for the organization where this application or proceeding is assigned are (703)

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872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.

Scott Knauss

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sak
May 1, 2003



HEMANG SANGHAVI
PRIMARY EXAMINER